Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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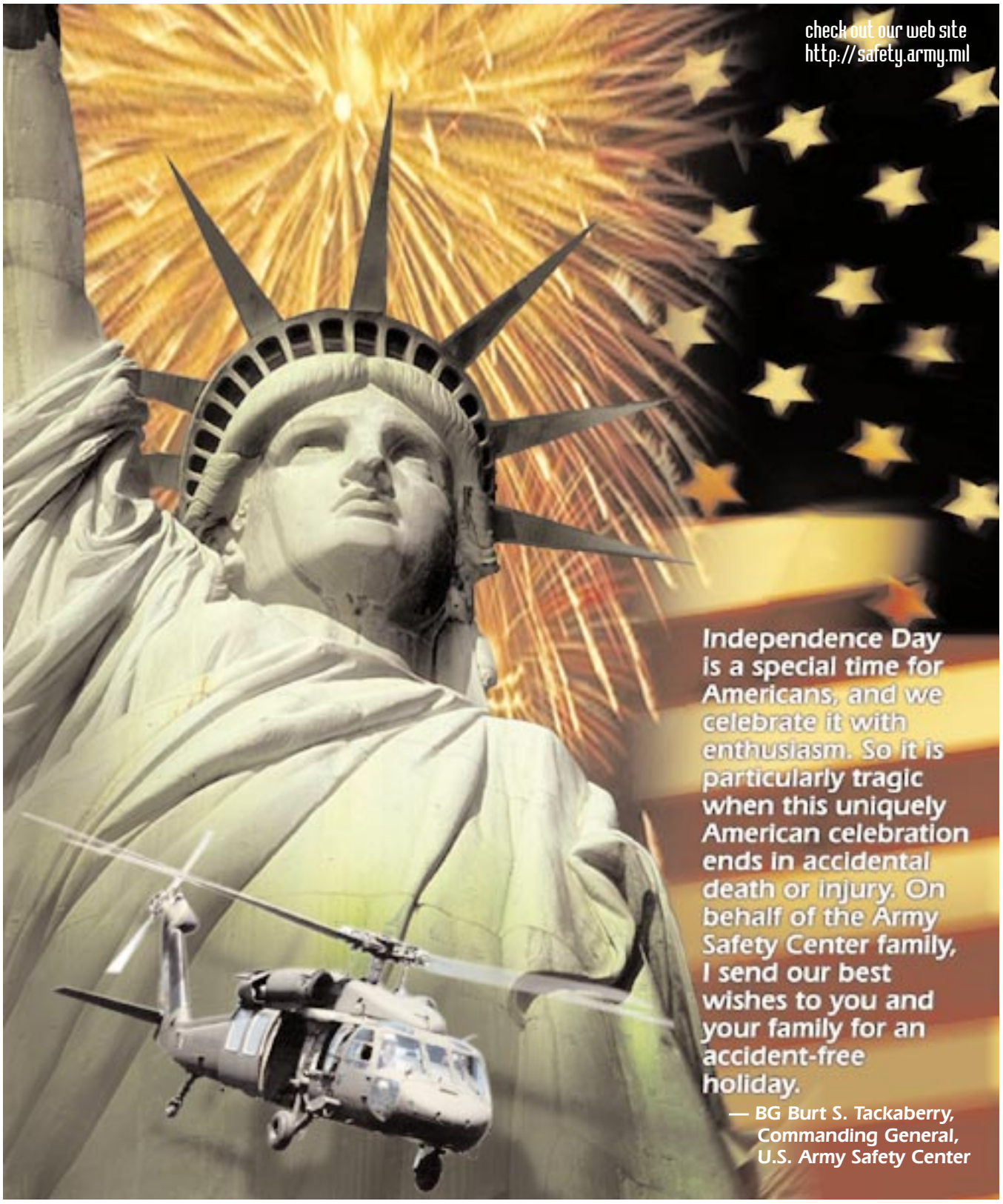


RISK MANAGEMENT LESSONS LEARNED

WAR STORIES

Who's flying the aircraft?

"Thud!"

That's the sound two flight helmets with heads in them make when they hit each other.

That's the sound my PC and I heard one beautifully clear day over the Adriatic Sea as we flew toward our destination, a Navy warship off the coast of Albania.

Somehow, two prior Cobra pilots ended up together in the cockpit of a CH-47D on this beautiful day. My PC had been a Cobra IP; I am a safety officer and am well aware of what flight-crew horror stories are made of.

I was all of 6 months out of the CH-47 qualification course, and the PC had a year of Chinook experience under his belt. We were ex-gun guys with over 4500 hours between us and stars on our wings to prove it. Friends since flight school and very comfortable flying together, we were a good crew mix.

Or were we?

Our mission was to aid in evacuating American citizens from civil-war-torn Albania. We would pick up our passengers from the ship and fly them to the airport at Brindisi, Italy, and return for more.

We had been flying this mission for 3 straight days, and boredom had become our biggest enemy. Over-water flight, with its lack of visual cues, dulls the senses and leaves one searching for tasks to complete in hope of maintaining alertness. This, in addition to the effortless way the CH-47D makes its way through the sky and the repetitive nature of our mission, led us right down the path of complacency to a breakdown in our crew coordination.

We were headed back out to pick up yet another load of passengers. I was on the controls and, thus, "outside" the aircraft; the PC, working the radios, had announced that he was "inside."

We were about 30 minutes off the coast of Italy when it happened.

"THUD!"

We had bumped heads while tuning the radios. We looked up at each other, and then it occurred to us: "Who's flying the aircraft?"

Of course, *I* was supposed to be. So why was I "inside" when I should have been "outside?" Could it have been all those years of flying a tandem-seat aircraft where the placement of the radios would have made it necessary for the pilot (in this case, me) to tune the radios?

I think so.

Force modernization has phased out familiar aircraft, placing Army aviators in newer ones. It is not uncommon today to have two aviators with several thousand hours between them flying an aircraft they only recently transitioned into—an aircraft in which they have only a few hundred hours between them. Such crew mixes bring on a whole new challenge in the arena of crew coordination.

Crew coordination's role in Army aviation is more important today than ever. The aircraft we fly are more technologically advanced, and our missions are increasingly more demanding. We ***must*** talk to each other!

—CW3 Mitch Kemptner, ASO, F Company, 159th Aviation Regiment, Giebelstadt, Germany, DSN 352-7852

Learned a lesson lately?

We don't have to learn our lessons the hard way—through accidents. We can also learn from close calls, near misses, and minor mistakes—both our own and those of others. In fact, we must do so, because the cost of accidents is paid in lives, dollars, and readiness.

Share your lessons learned with all of Army aviation by sending your "War Story" to *Flightfax*:

- U.S. Army Safety Center, ATTN: *Flightfax*, Bldg. 4905, 5th Ave., Fort Rucker, AL 36362-5363
- flightfax@safety-emh1.army.mil
- Fax: DSN 558-9478/3743 (334-255-9478/3743), ATTN: *Flightfax*

What passengers don't know *can* sometimes hurt

Aircraft crewmembers know what to do when they get into their aircraft—where to step and not step, what to touch and not touch, when and how to buckle and unbuckle their restraint system, where the fire extinguishers and survival kits are and how to use them, and that their helmet's chin strap should be secured and their sleeves rolled down. However, it's just as critical that passengers know these things.

Crew familiarity with routine and emergency procedures may cause them to forget that their passengers know little or nothing about such things. Lack of knowledge in these areas can lead to serious accidents and injuries.

The pilot-in-command of an Army aircraft is required to ensure that all passengers are briefed on such things as approach and departure from the aircraft, exits, clothing, weapons and ammunition, and security of equipment. Each aircraft operators manual contains guidance for these *required* passenger briefings. Following are some general suggestions that can apply to just about any aircraft passenger briefing.

■ **Flight data.** Inform passengers of intended route, altitude, time en route, and weather.

■ **Approaching and departing the aircraft.** Explain proper direction to approach and depart the aircraft to avoid rotor blades or propellers and exhaust heat. Also go over proper entry and exit procedures.

■ **Seating.** When passengers occupy seats in the area of aircraft controls, caution them against intentional or inadvertent interference with the controls both during flight and when entering or leaving the aircraft.

■ **Smoking.** Remind passengers that smoking is prohibited within 50 feet of any aircraft.

■ **Emergency entrances, exits, and equipment.** Identify location and demonstrate operation of jettisonable doors and windows, escape hatches, cabin doors, cargo ramps, cutout/kickout panels, first-aid kits, troop alarms and jump lights, and emergency escape equipment (axes, etc.).

■ **Safety belts and shoulder harnesses.** Familiarize passengers with use and operation of this equipment and the *requirement* to use it.

■ **Helmets.** If passengers are equipped with helmets, remind them to keep the chin strap secured.

■ **Overwater flight.** If flight will be conducted over water, familiarize passengers with flotation equipment and the location and general use of all life-support equipment and methods of emergency egress in water.

■ **Survival equipment.** Point out location and explain general use of equipment such as flares, survival radios, etc.

■ **Fire extinguishers.** Point out their location and explain how to use fire extinguishers.

■ **Clothing.** Brief passengers that shirt sleeves must be rolled down during the entire flight. Be sure that all passengers without helmets wear earplugs or other hearing protection.

■ **Protective masks.** If toxic chemicals are carried inside the aircraft, make sure all passengers have protective masks readily available.

■ **Refueling.** Ensure passengers off-load and remain at least 50 feet from the aircraft during refueling.

■ **Equipment security.** Caution passengers not to throw anything from the aircraft at any time, in flight or on the ground. In addition, remind them to secure all equipment inside the aircraft to prevent its becoming a missile during a crash and outside the aircraft to prevent its being sucked into rotor systems or engine intakes or being blown into people or equipment.

■ **Emergency landing position.** Explain and demonstrate proper body position: Bend forward at the waist with feet planted firmly on the floor. Rest chest on knees and hold the position by enfolding and locking arms around and behind thighs.

■ **Off-loading.** Instruct passengers that under normal conditions they should wait until they receive word from a crewmember. In an emergency, they should off-load as soon as possible and move away from the aircraft to avoid possible fire.

UH-1 lesson learned

I recently had a small problem that might be of interest to Huey and Cobra crews.

Flying a UH-1H, we had an electrical fire during final approach. Properly following emergency procedures, we turned off the main generator (actually already off because of a prior in-flight failure), the standby generator, and the battery. We landed safely but with lots of cockpit smoke and stench. However, with no electrical power, one cannot close the throttle fully from the cockpit (power is needed to release the idle stop), nor can one turn off the fuel (a fail-safe system that needs power to activate the shutoff valve). (If memory serves me right, the AH-1 operates similarly.) Fortunately, we figured it out quite quickly and briefly turned on the battery, closed the throttle, turned off the fuel, and then turned off the battery again.

Hope this helps somebody.

—CW5 Roger Weaver, 1-158th Cav, Maryland ARNG, rogerw@capaccess.org

On crew chiefs

I am dismayed that sometimes crew chiefs are not recognized for their importance as an integral part of the aircrew. I feel fairly typical of the experienced Army aviator, so I'd like to share my feelings on this subject.

I have spent three decades in Army aviation learning from, teaching to, and sharing with the most highly skilled, motivated, and dedicated soldiers in the Army—the aviation soldier. I learned very early in my career (day-one in Vietnam) to listen to my crew chief and learn about my machine from him. That's where I learned that we were a team, that the fact that I was up front and he was in the back made no difference. If he said my tail was too close to a tree or that there was a funny sound coming from the transmission, it meant it was time to do something NOW. If I told him I needed those troops out NOW, it meant "use your boot!"

My first crew chief taught me what to ***really*** look for as I did my preflight inspections, how to fire and take care of an M-60, and how to put the aircraft to bed so it was ready to go the next day. He also taught me how to open a can of C's easier and why a .45 was better than a .38.

I taught him how to hover.

We did these things and others because we were a team, a crew.

The Army called us both "crewmembers." I was "rated," he was "non-rated." He was a skilled mechanic, I was a skilled pilot. Differences? Yes. Important? No. We were both members of a team.

I was always grateful that the crew chief looked after our aircraft and kept it healthy and that he was always "watching my six." He was grateful that I didn't run us into trees. I don't remember either of us ever saying "thanks," but we didn't have to; we were a team.

Today's "non-rated" crewmember is, more than ever, an integral and critical part of the aircrew. Like pilots, crew chiefs have an Aircrew Training Program, have minimum requirements, and are essential to proper aircrew coordination.

So that is my perspective, formed early in my career and reinforced at every assignment where I was lucky enough to have a crew chief to work with. And to every crew chief I've worked with in my 30 years, I thank you.

—Anonymous

A look at an old problem

We usually think of dynamic rollover as something to be avoided during ***slope operations***. FM 1-203: *Fundamentals of Flight* addresses dynamic rollover in the section on slope operations; aircrew training manuals include a note in the maneuver description that the aviator must understand dynamic rollover before conducting slope operations; and dash 10s include a slope-landing limit intended to minimize the chances of dynamic rollover.

Why, then, do we continue to have at least one Class A dynamic-rollover accident each year? And why have dynamic-rollover accidents destroyed six aircraft and killed one Army aviator and disabled two others in the last decade?

The attention we've given to preventing dynamic rollover during slope operations has paid off; slope operations are now involved in only a third of our dynamic-rollover accidents. The other two-thirds occur during operations on ***flat*** ground. If we understand dynamic rollover and take the same precautions when operating on flat ground as we do when operating on slopes, we should be able to virtually eliminate such accidents.

Definition

Dynamic rollover is the occurrence of a rolling motion, while any part of the landing gear is acting as a pivot, that causes the aircraft to exceed a critical angle and roll over.

Dynamic rollover is caused by main rotor thrust. Untrimmed lateral main rotor thrust causes roll rates that make the aircraft exceed its critical rollover angle. Other physical factors that contribute to dynamic rollover are center of gravity, tail rotor thrust, crosswinds, ground surface, slopes, and main rotor design.

Type Aircraft	Class A	Class B	Class C	Injuries Fatal	Injuries Disabling	Total Cost
AH-1E	1	0	0	0	0	$1,500,000
AH-1F	1	2	0	0	0	1,858,388
OH-58A	6	1	2	1	2	2,122,865
OH-58C	3	0	1	0	0	749,976
OH-6A	0	0	1	0	0	84,192
TOTAL	11	3	4	1	2	$6,315,421

Figure 1. Dynamic-rollover accidents, FY87 - FY97

...fly the aircraft *until* the aircraft's entire weight is on the gear.

Main rotor thrust

Main rotor thrust is laterally trimmed when it is acting more or less vertically. When hovering, a helicopter is laterally trimmed when ground movement is zero. If the helicopter has a pivot point in contact with the ground and main rotor thrust is not laterally trimmed, the sideward component of that thrust will roll the helicopter around the pivot. The roll rate depends on the cyclic input from the trimmed position and on the amount and rate of collective input. If the roll rate is high, the aircraft can rapidly reach its critical rollover angle.

Pilots can do two things to avoid dynamic rollover:

- Ensure that the cyclic is positioned to keep main rotor thrust laterally trimmed when touching down or lifting off to a hover.
- Stay alert to changes in aircraft attitude.

When touching down, adjust the cyclic only as necessary to maintain lateral trim and ensure a vertical descent until the aircraft's entire weight is on the landing gear. In most helicopters, once the collective is fully down, place the cyclic in the neutral or central position. In the AH-64 and UH-60, cyclic adjustment is coordinated with collective reduction.

When lifting off, first position the cyclic to ensure that main rotor thrust is vertical. As a guide, the main rotor tip path plane should be parallel to the horizon. As collective is increased and the helicopter becomes light on the gear, adjust the cyclic to compensate for winds, aircraft loading, and translating tendency. To ensure a vertical ascent, make further adjustments as each wheel or skid leaves the ground.

The pilot on the controls must always be alert to the cyclic's position, and all control movements must be smooth and coordinated. Maintain lateral trim with the cyclic, and do not apply excess cyclic to pin a wheel or skid to the ground during landing or takeoff. When landing, fly the aircraft until the aircraft's entire weight is on the gear. When taking off, start flying the aircraft before raising the collective. To avoid dynamic rollover, use these landing and takeoff techniques regardless of whether the aircraft is on flat or sloping ground.

Center of gravity

The critical rollover angle changes as the center of gravity (CG) changes. Helicopters generally have different CGs and, therefore, different critical angles in different configurations. The CG and critical angle change as fuel and ammunition are used. Asymmetric loading will also change the critical angle and make the aircraft more likely to roll toward the heavier side.

Be conscious of changes in CG that occur during the mission, and avoid asymmetric loading. When landing or taking off, think about the effect of the aircraft's CG ***before*** beginning the maneuver.

Tail-rotor thrust

In single-main-rotor helicopters, tail-rotor thrust can contribute to high roll rates. Because tail-rotor thrust acts to the right, the tail rotor tends to roll the aircraft in that direction, especially when the right skid, wheel, or float is acting as a pivot.

Historically, 9 out of 10 dynamic-rollover accidents have involved rollover to the right. Many of these accidents might have been avoided if the pilot on the controls had adjusted the cyclic to compensate for tail-rotor thrust (translating tendency), especially while lifting off to a hover.

Care must be taken when applying pedal inputs to ensure they are smooth. Adjust lateral trim with the cyclic whenever tail-rotor thrust is changed by pedal inputs. When increasing the collective, apply left pedal. As thrust is increased, adjust the cyclic to the left to compensate for increasing tail-rotor thrust to the right.

Crosswinds

Crosswinds acting on the fuselage can help roll a helicopter over. Avoid lifting off or touching down with crosswinds. If there is a crosswind, make the proper cyclic adjustment into the wind to keep the aircraft laterally trimmed. Crosswinds also require tail-rotor-pedal inputs to maintain directional control. Again, these tail-rotor thrust changes must be trimmed by cyclic inputs as necessary.

Ground surface

Rough ground or obstructions that pin a wheel or skid to the ground can contribute to dynamic rollover. Several rollover accidents have been caused by hitting an obstruction with the landing gear or by attempting a takeoff with an obstruction next to the gear. Accidents have also occurred when the aircraft was allowed to slide laterally across the ground. This can cause fuselage roll rates to develop, leading to dynamic rollover. Cold-weather operations introduce yet another danger. During liftoff, one skid will sometimes remain frozen to the ground after the other skid breaks free, resulting in the aircraft rolling over.

...start flying the aircraft *before* raising the collective.

When operating close to the ground, watch for obstructions and carefully select a landing point. If you inadvertently land with the skid or wheel against an obstruction, it would be safer to shut down and have the helicopter towed away or remove the obstruction than to attempt a takeoff.

It shouldn't be necessary to mention the need for a proper preflight inspection. However, aircraft still occasionally roll over because pilots try to take off with mooring chains still attached.

Slopes

When landing or taking off from a slope, a helicopter will roll over if the maneuver is continued after cyclic control limits are reached. Once a limit is reached, correct lateral cyclic trim cannot be maintained. Observe caution when operating on any slope, and take particular care to avoid slopes greater than the aircraft's slope limitation.

Main-rotor design

If you're an AH-64, UH-60, OH-58D, or CH-47 pilot, you already realize how sensitive these aircraft are to lateral cyclic inputs. These aircraft have good control authority; that is, they respond rapidly to cyclic inputs. Hence, they are quick to develop roll rates. However, the cyclic is also very effective in stopping that roll rate once it's detected.

Teetering-head helicopters—OH-58A/Cs, UH-1s, and AH-1s—are slow to develop a roll rate, but their control authority is so poor that cyclic inputs alone are unlikely to prevent rollover once a roll rate has developed. This characteristic is reflected in the accident data for the past decade: Every one of the Class A and B and all but 1 of the Class C dynamic-rollover accidents involved teetering-head helicopters.

While aviators have no control over the design of their aircraft's rotor, they do need to be aware of its characteristics. In a teetering-head helicopter, collective reduction is most effective at stopping a high roll rate. In other helicopters, cyclic input also has a rapid effect. Regardless of rotor design, actions needed to correct a roll rate are the same and should be instinctive: simultaneously reduce collective and adjust cyclic to maintain lateral trim.

Other factors

The physical factors already discussed—main-rotor thrust, center of gravity, tail-rotor thrust, crosswinds, ground surface, slopes, and main-rotor design—cause dynamic rollover. It's important that pilots understand that the way to prevent dynamic rollover is to avoid the physical factors that cause it. When they fail to avoid these ***physical*** factors, it's usually because of one or more of the following ***human*** factors.

- **Inattention.** The pilot on the controls risks dynamic rollover any time he or she becomes inattentive to the aircraft's position over the ground or its attitude while lifting off or touching down. Any time you're on the controls, use extra care when operating close to the ground.
- **Inexperience.** Inexperienced student pilots and low-time copilots have been on the controls in a large proportion of dynamic-rollover accidents. If you are the pilot-in-command, you are always responsible for the aircraft. Guard the controls, and monitor the pilot on the controls.
- **Failure to take timely action.** The time to take action is ***before*** a roll rate develops. By the time you notice that a roll rate has developed, a rollover may be inevitable, especially in a teetering-head helicopter. When you detect a roll rate developing, simultaneously reduce the collective and adjust the cyclic to maintain lateral trim.
- **Inappropriate control inputs.** This error is the root cause of almost all dynamic rollovers. Smooth and careful application of control inputs is the key to avoiding dynamic rollover.
- **Loss of visual reference.** If you lose visual reference while operating close to the ground, take off or execute a go-around, using instrument techniques if necessary. If the aircraft contacts the ground while drifting sideward, rollover can occur.

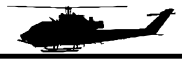
Summary

Dynamic rollover can be avoided by paying attention to the factors, both physical and human, that contribute to it. Trim the aircraft with the cyclic during landing and takeoff, and remain alert to the aircraft's attitude. Above all, fly the aircraft: when landing, until the aircraft's entire weight is on the landing gear; when taking off, before any collective is applied. And remain alert to the cyclic position and maintain lateral aircraft trim with the cyclic at all times, regardless of whether the aircraft is on flat or sloping ground.

—Update of a November 1991 *Flightfax* article by MAJ Trevor Jones, Directorate of Evaluation and Standardization, U.S. Army Aviation Center, Fort Rucker, AL

Case summaries: Dynamic-rollover accidents

AH1



Class A

E series

■ During night NVG departure from sandy area, crew lost visual reference with ground in brownout conditions and rolled aircraft on its right side.

F series

■ After refueling, aircraft climbed to 30 feet and air-taxied 300 meters to unlit holding area. As aircraft touched down, it began sliding right and started to roll. PC was unable to stop roll rate, and aircraft entered dynamic rollover and came to rest on its top right side.

Class B

F series

■ As pilot came light on skids during takeoff from sloping terrain, aircraft began to slide to right rear down slope. As pilot rapidly lowered collective and added cyclic into slope to arrest slide, rear of right skid dug into ground. Aircraft rolled right and down slope, coming to rest on its right side. Nearly inverted with engine still running, aircraft sustained major damage.

■ Malfunction in roll sensor amplifier module of SCAS as control inputs were being applied caused aircraft to abruptly roll right during attempted takeoff to a hover. Main rotor blades contacted ground, and transmission and main rotor system separated from aircraft. Aircraft was extensively damaged.

OH6

Class C

A series

■ After making adjustments to compensate for a light-collective tendency, MP started aircraft and brought it to full operating rpm. Judging collective to be excessively light, he reduced throttle to a setting above flight idle. Using his knee to hold collective down, he bent over to pick up a wrench from cockpit floor. As he did so, collective pitch stick slipped from under his knee and went to full up position. Aircraft came off ground and rolled left 90 degrees, coming to rest on its side and sustaining extensive damage to main-rotor system.

OH58

Class A

A series

■ Aircraft came to rest on its right side after encountering dynamic rollover during takeoff to a hover from level field site. Aircraft was destroyed; two crewmembers were injured.

■ Aircraft encountered dynamic rollover during night NVG landing from a hover. PC became spatially disoriented due to lack of visual cues over tall grass. Perceiving a slope where there was none, he allowed aircraft to roll right to point that blades hit ground. Aircraft was destroyed; one crewmember was injured.

■ Aircraft moved laterally to right as it descended from 3-foot hover during night orientation flight. Upon ground contact, main rotor blades struck ground and aircraft rolled onto its right side. IP was killed, student was injured, and aircraft was extensively damaged.

■ During blowing-snow approach and run-on landing, aircraft touched down skid/skis level and slid forward to where right skid/ski fell into rut created by a ski-equipped CH-47. Aircraft rolled to right, coming to rest on its right side. Aircraft was destroyed.

■ When upslope skid left ground during takeoff to a hover from side slope, student reacted by attempting to correct with cyclic control without lowering collective pitch. As a result, aircraft exceeded its critical rollover angle and rolled downslope onto its right side. It was damaged beyond economical repair.

■ After removing right front tiedown chain, crew chief unknowingly dropped it on top of right towing ring, where it became entangled. Later, during pickup to a hover, tiedown caused aircraft to roll right and nose down. Main-rotor blades struck ground, and transmission was torn from aircraft. Aircraft came to rest upright after sustaining extensive damage.

C series

■ While landing unaided at night, pilot approached ground with slightly excessive rate of descent and in right drift. Aircraft hit ground, bounced, became airborne, moved laterally to right, contacted ground on right skid, and rolled onto its right side, sustaining extensive damage.

■ Aircraft drifted right during day landing to open terrain as PC focused his attention on instruments. Right skid contacted ground as aircraft drifted laterally to right, and aircraft rolled onto its right side. Aircraft was destroyed; one crewmember was injured.

■ During takeoff to a hover, SP applied excessive right cyclic and aircraft encountered dynamic rollover. IP was unable to react in time to prevent aircraft from rolling over on its right side. Aircraft was destroyed, but crewmembers were uninjured.

Class B

A series

■ During takeoff from slope by copilot who was not OH-58 qualified, aircraft became light on skids and then continued to pivot around right skid assembly until main-rotor system and right horizontal stabilizer contacted ground. Aircraft came to rest on its right side after main-rotor system separated and tail boom sheared at attachment points.

Class C

A series

■ SP was attempting slope landing with right skid upslope. When he lowered collective with right skid down, aircraft began to slide down slope. SP corrected with collective pitch and cyclic, and aircraft rolled onto its right side.

■ When pilot increased collective to come to a hover, aircraft drifted slightly and began rolling motion to right. Pilot maintained heading and immediately lowered collective and applied left cyclic. Main-rotor blades struck ground on right side and separated from aircraft, which came to rest on original heading in upright position.

C series

■ With aircraft at out-of-ground-effect hover, IP attempted sliding right-pedal turn to reposition aircraft. As he did so, right landing gear contacted tree, and aircraft rolled to right and crashed inverted.

Hellfire system test set

A recent worldwide AH-64/OH-58 unit visit made it apparent that some units have outdated technical manuals and changes for the ATGM114 Hellfire system and AN/TSM HF 205 test set. The following are the current TMs and change numbers:

■ **ATGM114 Hellfire Missile System:** TM 9-1427-475-20 (14 Jun 91) with change 9.

■ **AN/TSM HF 205 Test Set:** TM 9-4935-462-12, +P (15 May 96) with no changes.

POCs: CPT Josh Sauls and Mr. Larry Niver, TSM-LB, DSN 558-3529 (334-255-3529), atzqtsml@rucker-emh4.army.mil; or SFC L.K. Faulkner, PMO Hellfire, DSN 788-0286 (256-842-0286), faulkner-lk@redstone.army.mil

Reminder: Up-slip required after medical referral

Downsizing of military health-care facilities has resulted in more and more off-post referrals. Aircrewmembers should note that such referrals do not excuse them from obtaining a DA Form 4186 (up-slip) from their local flight surgeon before returning to flight duty.

Regulations (ARs 40-8, 40-501, and 600-105) require that, after medical treatment, aviators report to the flight surgeon for appropriate fitness-for-flying determination before returning to flying duty. This is done to ensure that the medical condition, medication, or procedure does not affect the aviator's ability to perform flying duties safely. Specifically, AR 40-501, paragraph 6-11b(5) requires that DA Form 4186 be completed after treatment by a health-care professional other than a military flight surgeon.

If you have any questions on this issue, consult your unit flight surgeon.

POCs: MAJ John Albano, DSN 558-6943 (334-255-6943), or Mr. Joe Licina, DSN 558-6893 (334-255-6893), licina@rucker-emh2.army.mil, U.S. Army Aeromedical Research Laboratory, Fort Rucker, AL

Recap of maintenance-information messages

AH-64-98-MIM-02, 171825Z Feb 98
Changes time between overhaul (TBO) of certain tail rotor swashplates.
AMCOM contact: Mr. Ken Muzzo, DSN 897-4812 (205-313-4812), muzzo-kw@avrdecr.redstone.army.mil

AH-64-98-MIM-03, 191341Z Feb 98
Authorizes continued inspection of strap pack borescope at 20-hour intervals pending publication of change 6 to TM 1-1520-238-23 in May.
AMCOM contact: Mr. Ken Muzzo, DSN 897-4812 (205-313-4812), muzzo-kw@avrdecr.redstone.army.mil

AH-64-98-MIM-04, 021324Z Apr 98
Corrects inaccurate effectivities for pilot power quadrant listed in TM 1-1520-238-23P, dated 28 May 96.
AMCOM contact: Mr. Ken Muzzo, DSN 897-4812 (205-313-4812), muzzo-kw@avrdecr.redstone.army.mil

AH-64-98-MIM-05, 131935Z May 98
Alerts users to possible faulty components on the AH-64 captive boresight harmonization kit (CBHK) that could potentially affect equipment accuracy.
AMCOM contact: Mr. Ed Daw or Ms. Kathlyn Dulaney, DSN 897-1423 (256-313-1423)

AH-64-98-MIM-06, 091415Z Jun 98
Outlines procedures for repacking main rotor head lower bearing with grease at same time upper bearing is repacked.
AMCOM contact: Mr. Ken Muzzo, DSN 897-4812 (205-313-4812), muzzo-kw@avrdecr.redstone.army.mil

GEN-98-MIM-01, 041942Z Feb 98
Confirms that additive deficiency exists in two lots of MIL-L-23699E corrosion-inhibited gas turbine engine oil manufactured by Mobil Oil Corporation.
AMCOM contact: Mr. Art Ather, DSN 897-1402 (205-313-1402), ather-im@exchange1.redstone.army.mil

OH-58D-98-MIM-02, 091430Z Mar 98
Clarifies repair criteria for low-smoke combustion liner installed in certain engines.
AMCOM contact: Mr. Jim Bartlett, DSN 897-4993 (205-313-4993), bartlettj@redstone.Army.mil

OH-58D-98-MIM-03, 091445Z Mar 98
Expands transmission overtorque limits.
AMCOM contact: Mr. Edward Mueller, DSN 645-9805 (205-955-9805), muellere@exchange1.redstone.army.mil

OH-58D-98-MIM-04, 011450Z May 98
Provides additional guidance for operating in desert environment to prevent engine wear and clogged air particle separator swirl tubes due to sand and grass accumulation in aft section of inlet shield assembly.
AMCOM contact: Mr. Gene Mergel, DSN 645-9806 (205-955-9806), mergele@avrdecr.redstone.army.mil

Accident briefs

Information based on *preliminary* reports of aircraft accidents

AH64

Class B

A series

■ While purging fuel line bubble burn during hot refueling, crew noted smoking and sparking from No. 2 engine. At that time, main-rotor blades contacted PNVS and gunner's canopy. Crew executed emergency shutdown procedures and egressed without incident. PNVS and all blades sustained severe damage; engine and sudden-stoppage damage inspections are pending.

Class C

A series

■ Awaiting takeoff as Chalk 4 of flight of four, PC placed No. 1 power lever at idle to conserve fuel. On takeoff, he noted engine torque on No. 2 engine at 135 percent after about 10 seconds. PC reduced collective below 120 percent torque and moved No. 1 power lever to fly position. After torque stabilized, PC returned to takeoff point and landed without incident.

■ After maintenance test flight, crew noted that TADS day-side assembly shroud was missing. Clamp was still installed, and safety wire was intact. Cost of shroud is $30,624, and other minor damage was noted.

Class D

A series

■ During maintenance test flight for rotor track and balance, L-200 panel came open. On short final, crew experienced stuck pedal and aircraft began to yaw to right. At 10 feet, PI disengaged power by chopping the chop collar. Aircraft autorotated to runway and emergency shutdown was completed. Panel had jammed bellcrank to tail rotor. L-200 panel and drive shaft coupling were damaged.

■ Postflight inspection after landing revealed that right outboard P3 panel was missing. Fasteners and small piece of panel were still attached and intact. Panel was replaced.

CH47

Class C

D series

■ Aircraft experienced Nr reading at 120 percent for 1 second during runup in preparation for flight. Crew executed emergency shutdown. Engine inspection pending.

■ Midway through shutdown with thrust at ground detent and 100-percent rotor rpm, aircraft shuddered and rotor rpm and engine torque increased. As rotor rpm reached 120 percent, crew moved both engine condition levers to stop position and continued with normal shutdown.

■ When No. 2 ECL was moved from ground to stop during normal shutdown, crew heard rumbling from No. 2 engine and aircraft shuddered. When PTIT rose to 300°C, crew pulled fire handle. After noting no fire, crew continued shutdown. Postflight revealed shearing of Nos. 1 and 2 generator shafts and failure of No. 2 N2 actuator and sprag clutch.

Class D

E series

■ Postflight inspection revealed damage to aft rotor head as result of separation of rain shield in flight. Damage restricted to pylon area; no damage to rotor blades or swashplate.

Class E

D series

■ On short final after 1 hour flight, flight engineer heard thumping sound from No. 1 engine. PC checked engine instruments; torque was zero, N1 was 40 percent, and PTIT was 795°C. PC placed ECL to stop and motored engine to drop PTIT to below 260° as aircraft was landed. Incident is under investigation.

E series

■ When crew executed 180-degree turn to gain altitude, aircraft entered tailwind and settling/descending condition. Aircraft settled to 150 feet agl before initiating climb. No. 2 engine exceeded temperature limitations for 24 seconds. No engine damage.

OH58

Class A

D(I) series

■ Aircraft landed hard during orientation flight. Suspect inadvertent manipulation of collective. Aircraft sustained major damage to tail boom, airframe, and landing gear. Accident is under investigation.

Class C

C series

■ During pinnacle landing at night under NVGs, aircraft touched down on aft third of landing area. On touchdown, aircraft rocked back and nose pitched up. When PI in right seat applied forward cyclic, loud bang resulted and aircraft began to shake violently. Main-rotor blade had struck upper wire-cutter assembly. Crew performed emergency shutdown and safely exited aircraft.

D(I) series

■ During gunnery training, aircraft tail rotor hit tree after having been cleared to new firing position. Both tail-rotor blades were damaged.

■ During simulated engine failure at altitude, IP applied initial collective pitch between 20 and 30 feet agl. Low rotor rpm audio alarm sounded, alerting crew that throttle was still at idle. IP leveled aircraft and began to roll throttle back on but decided to roll it back to idle and applied all remaining collective pitch. Aircraft landed hard on skid heels and slid 70 feet along runway. Aircraft sustained damage to main-rotor blade, tail-rotor drive shaft, drive shaft covers, GPS antenna, and skid tube.

■ En route to FARP after firing two tables of .50-cal and rockets, left door fell off into impact area. Door was not recovered; aircraft landed at FARP without incident.

Class E

C series

■ Aircraft was told to land immediately because of improper maintenance. Logbook did not indicate that complete maintenance had been

For more information on selected accident briefs, call DSN 558-2785 (334-255-2785). Note: Information published in this section is based on preliminary mishap reports submitted by units and is subject to change.

performed on PC links of rotor system.

■ Cyclic had excessive play in aft quadrants during IGE hover. Aircraft landed without incident. Maintenance replaced pilot cyclic pivot lever.

D(I) series

■ Transmission chip caution displayed during cross-country flight. After three unsuccessful burn-off attempts, crew landed without incident. Maintenance was unable to flush transmission system, so transmission was replaced.

■ Right pedal stuck during night NVG training mission. PC completed power-on run-on landing without further incident. Troubleshooting revealed that magnetic brake on tail rotor servo had failed. Brake was replaced.

UH1

Class C

V series

■ During IGE hover, transmission oil pressure gauge indicated zero without corresponding transmission oil pressure low light. Crew landed immediately. During hover to ramp 200 feet away, noise from transmission area increased and transmission oil pressure low light illuminated momentarily. Crew again landed immediately. Upon ground contact, aircraft began uncommanded left yaw. ME retarded throttle, and transmission seized. Main rotor made approximately two rotations before it completely stopped. Aircraft remained upright, sustaining damage due to sudden stoppage and resultant torque effect on airframe. Small oil fire noted in upper transmission area was extinguished without incident.

Class E

V series

■ Master caution and chip detector caution lights came on during in-ground-effect hover. Caused by failure of debris monitor (with ODDS).

UH60

Class C

A series

■ Main-rotor blades struck trees during takeoff. Three tip caps were damaged.

■ Input module exploded in cruise flight at 900 feet msl, resulting in damage to hydraulic system, engine, and fuselage.

K series

■ Five minutes into hover check after 30-minute full rpm ground runup following replacement of No. 1 accessory gearbox, crew noted vibration and illumination of rotor-brake light. As aircraft was being set down, crew noted grinding noise and performed emergency shutdown, during which rotor brake failed to engage. Inspection revealed damage to main transmission, oil cooler, and drive train in addition to rotor brake. Incident is under investigation.

L series

■ During approach to PZ, main-rotor system contacted two wires extended across field. Both wires were severed, and aircraft yawed 90 degrees to right. Aircraft was landed and shut down without further incident.

Class D

A series

■ During shutdown after NVG continuation training, pilot was unable to retract searchlight. Postflight inspection determined that searchlight mounting bracket was bent. Crew reported no unusual noise during operations. Searchlight assembly was replaced.

L series

■ After initial hookup with load (M119A1 howitzer) still on ground, aircraft drifted forward 2 to 3 feet. CE told CP to "come back two." Right sling leg caught under right recoil piston, causing gun to roll over onto its left side. Crew released load, but not in time to prevent gun from rolling over, damaging gun-sight mount.

Class E

A series

■ Loud, sharp reports were heard from No. 1 engine during runup. Crew initiated emergency procedure for compressor stall and shut down engine without any limits being exceeded. Engine was removed; inspection revealed foreign-object damage due to rivet. Exact source of rivet is unknown.

■ During refueling, crew chief noticed that right-side step cover was attached only by two fasteners. Bottom hinge had completely failed.

■ No. 2 engine flamed out when pulled to idle during simulated engine failure at altitude. Crew declared emergency and initiated roll-on landing. After restarting engine, crew obtained approval for one-time flight to home base. After uneventful flight, No. 2 engine again flamed out during shutdown. Anti-ice valve was replaced.

■ Postflight inspection revealed repairable damage to two main-rotor blade caps. Suspect blades contacted grounding rod of perimeter fence during taxi for takeoff.

L series

■ While ground taxiing to parking, PI noted that greater amount of power was required to perform normal taxi. Shortly thereafter, right tire stopped rotating, and PI terminated ground taxi and hovered to parking. Maintenance found right brake quick-disconnect line unsecured. Suspect crewmember accidentally stepped on and twisted connector during preflight, causing slow loss of fluid.

C12

Class D

C series

■ During taxi to parking spot, welcome mat was blown into left propeller. Mat had been placed 15 feet into parking area.

G series

■ During postflight inspection, crew noted right antenna pod had 1-inch-diameter area with chipped paint and a pin hole. Further inspection revealed left upper dipole antenna had broken epoxy at tip and also 1/8-inch of skin missing from aft outboard corner of left elevator. Suspect lightning strike.

H series

■ During engine runup in hard shelter igloo, overhead light fell from ceiling and struck aft upper portion of horizontal stabilizer and aft dipole antenna.

Class E

D series

■ During base turn to final after 20 minutes of engine operation, both pilots felt burning sensation in their eyes and had difficulty breathing due to noxious smell in cockpit. Caused by failure of avionics blower.

F series

■ Engine failed during startup due to fuel starvation. Maintenance replaced fire wall fuel shutoff valve.

Aviation messages

Recap of selected aviation safety messages

Aviation safety-action messages

AH-64-98-ASAM-05, 131950Z May 98, informational

See UH-60-98-ASAM-06 below. There have been no confirmed ground or in-flight flame-outs attributed to the ODV within the AH-64 fleet. This message is only to inform AH-64 users of the problem since the ODV is used on all T700-GE-701 and -701C engines.

AMCOM contact: Mr. Howard Chilton, DSN 897-2068 (256-313-2068), chilton-hl@redstone.army.mil

CH-47-98-ASAM-04, 141621Z May 98, maintenance mandatory

Investigation has identified 23 aft transmissions that have been overhauled with improper shimming of the input shaft. This deficiency causes excessive vibration of the transmission and premature wear of the input pinion gear and its mating gear. The shimming procedure has been corrected by tool modification, and only aft transmissions overhauled before 8 December 1997 are considered suspect. This message requires a one-time inspection to find improperly shimmed aft transmissions.

AMCOM contact: Mr. Howard Chilton, DSN 897-2068 (256-313-2068), chilton-hl@redstone.army.mil

UH-60-98-ASAM-06, 131950Z May 98, informational

There have been several T700-GE-701C engine flame-outs in UH-60L aircraft while operating on the ground. The flame-outs have been attributed to the overspeed and drain valve (ODV). The flame-out usually occurs just as the power control lever is moved from "fly" to "idle." Other factors associated with these incidents are that the aircraft have been on the ground and at flat pitch for a period of time. To date there have been no in-flight flame-outs attributed to the ODV. The purpose of this message is to inform users of these incidents and actions taken to preclude recurrence.

AMCOM contact: Mr. Ed Goad, DSN 897-2095 (256-313-2095), goad-er@redstone.army.mil

Safety-of-flight messages

UH-1-98-SOF-06, 141508Z May 98, technical

A coated N2 spur gear has been developed that attenuates stresses in the gear. This gear will be installed on some UH-1 aircraft that have passed the vibration inspection required by TB 1-2840-229-20-15. This message directs installation of coated N2 spur gears in a limited number of T53-L-13B engines and outlines procedures for scheduling N2 spur gear replacement.

AMCOM contact: Mr. Robert Brock, DSN 788-8632 (256-842-8632), brock-rd@redstone.army.mil

UH-1-98-SOF-07, 021449Z Jun 98, technical

Two problems have been identified on the UH-1 rod end clevis (P/N 204-011-136-103 or 1615UH1-100-1). Parts manufactured by GT Machine do not meet strength requirements, and some parts have been found without serial numbers to identify the manufacturer. All such parts shall be immediately removed from service. The purpose of this message is to require a one-time inspection of the rod end clevis.

AMCOM contact: Mr. Robert Brock, DSN 788-8632 (256-842-8632), brock-rd@redstone.army.mil

POV-fatality update through May

Speed ⊙
Fatigue ⊙
No seatbelt ⊙

No new causes, just new victims

	FY98	FY97
	80	57

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Class A Accidents through May

		Class A Flight Accidents		Army Military Fatalities	
		97	98	97	98
1ST QTR	October	0	2	0	0
	November	0	1	0	0
	December	1	2	0	2
2D QTR	January	2	1	2	0
	February	0	1	0	0
	March	2	1	1	0
3D QTR	April	2	0	2	0
	May	1	1	1	0
	June	3		0	
4TH QTR	July	1		8	
	August	0		0	
	September	0		0	
	TOTAL	12	9	14	2

U.S. ARMY SAFETY CENTER

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